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CSS BAFFIN

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Department of Energy, Mines and Resources

"The sea drowns out humanity and time; it has no sympathy for either, for it belongs to eternity."

—O. W. Holmes

Bounded north, west and east by three oceans, Canada possesses one of the world's longest coastlines. Her coastal waters and continental shelves contain vast food and mineral resources. Her enormous inland fresh-water system draws the world's shipping to the heart of the continent.

Canada faces a formidable challenge to provide modern surveys of her marine environment, thus contributing to the ever-increasing store of knowledge about the sea, and the development of the resources of her continental shelves.



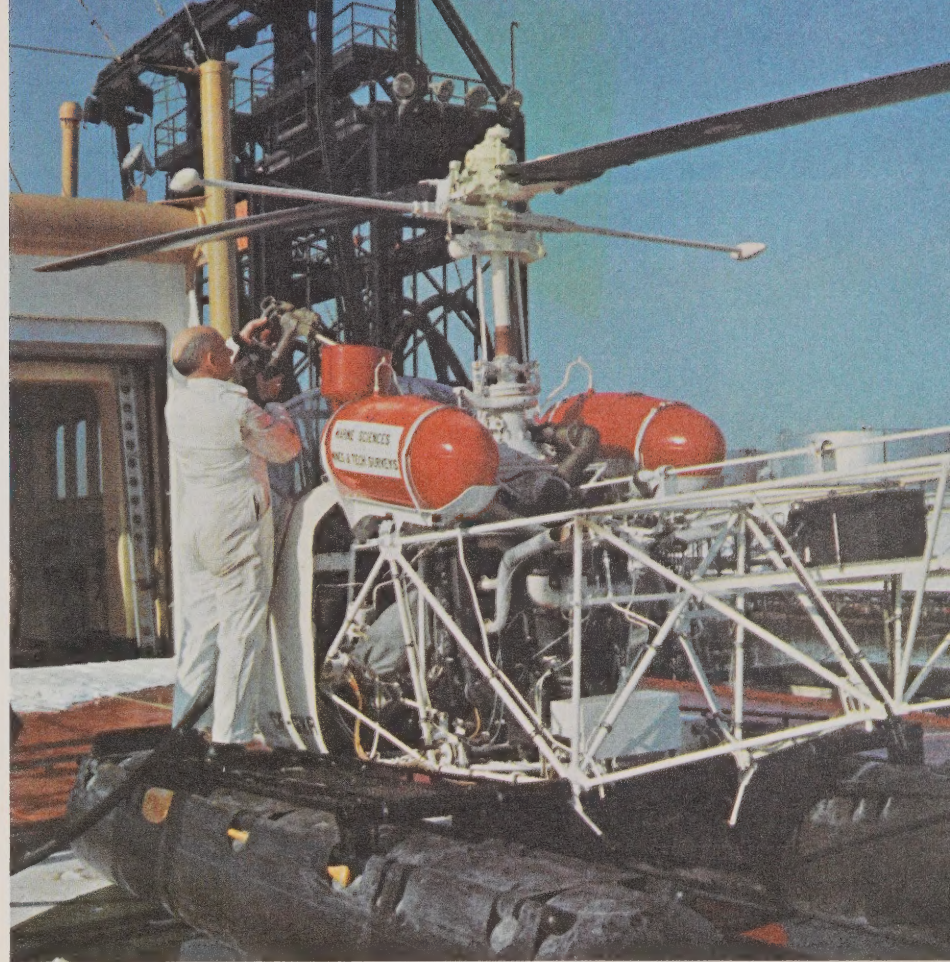
Canadian Survey Ship Baffin

is one of the most modern hydrographic survey and research ships afloat. She was built in 1956 as part of Canada's expanding program to provide nautical charts for resources development and defence purposes. Designed primarily for Arctic operations, *Baffin* also has charted large sections of the vast fishing banks on Canada's east coast and of the tropical Caribbean waters.

A major ship in the fleet of Canada's Department of Energy, Mines and Resources, *Baffin* sails out of the Bedford Institute of Oceanography at Dartmouth, Nova Scotia.

Type of Vessel

CSS *Baffin*, one of Canada's major hydrographic and oceanographic research ships, is a twin-screw, diesel-electric-powered vessel, 285 feet in length, with a displacement of 3,700 tons. She has a draft of 17 feet 9 inches, and gross and net tonnages of 3,460 and 1,319.



Helicopter refuelling on Baffin's flight deck.

Propulsion—Four 12-cylinder diesel engines supply 8,000 BHP to two fixed-blade propellers through Hindmarch reverse-reduction gears. The diesel fuel capacity is 900 tons.

Baffin cruises at 13½ knots with a maximum speed of 15½ knots. Able to support herself for a complete Arctic season's operations, her cruising range is 14,000 miles on a single fuelling. She is ice-strengthened and powerful enough to permit effective and safe movement in Arctic waters. Anti-rolling tanks were installed in 1964.

Electrical Power—Auxiliary electrical energy in the form of 3-phase, 60-cycle alternating current, at a constant line-pressure of 440 volts is supplied by three 400-KW, 450-volt, 3-phase, 60-cycle alternating current, 80% power factor diesel-driven generators arranged for parallel operation. One 150-KW, 450-volt, 3-phase, 60-cycle, diesel-driven emergency generator is also installed.

440-volt Services—Engine-room auxiliaries, capstan, steering gear, windlass, boat winches, engine-room and accommodation ventilation, and refrigeration.

The following services are supplied from the 440-volt system:

- lighting, 115-volts, single phase AC;
- navigation aids, 115-volts, single phase AC;
- miscellaneous power such as small motors up to 25 HP, 115-volts, single-phase AC;
- galley and water heating, 220-volts, 3-phase AC.

Two 440/220-volt AC-DC motor generator sets supply power to the deep-water winch, cargo winches, electrical cranes and degaussing equipment.

Baffin is fitted with the most modern navigational devices including precise radars, echo-sounders and both long- and short-range electronic positioning equipment.

Navigation Aids—

One Type 45 and one Type 838 Decca radars;
Decca Lambda or Hi-Fix position-fixing systems;
Decca Navigator Mark XII receiver with course recorder;
Sperry Loran Mark II;
Sperry Gyro compass with 6 repeaters;
Marconi direction finder;
Walker Commodore log;
Sal-24 Marine log;
Standard magnetic compass.

Communication Equipment—

MacKay W/T console consisting of:

- 250W H/F transmitter, Type 2003 NP, with R/T facility, range 2-24 Mc/s;
- 200W M/F transmitter, Type 2001K, CW/MCW, range 355-500 Kc/s;
- 40W emergency transmitter, Type 2002K, range 355-500 Kc/s.

RCA 100W single side-band/CW Mk IV transceiver, range 2-16 Mg/s.

Spilsbury and Tindall 25W, 410 Kc/s non-directional beacon transmitter for ship-to-helicopter use.

Canadian Marconi R/T, model CN86.

Pye Electronics VHF.

Echo Sounders—

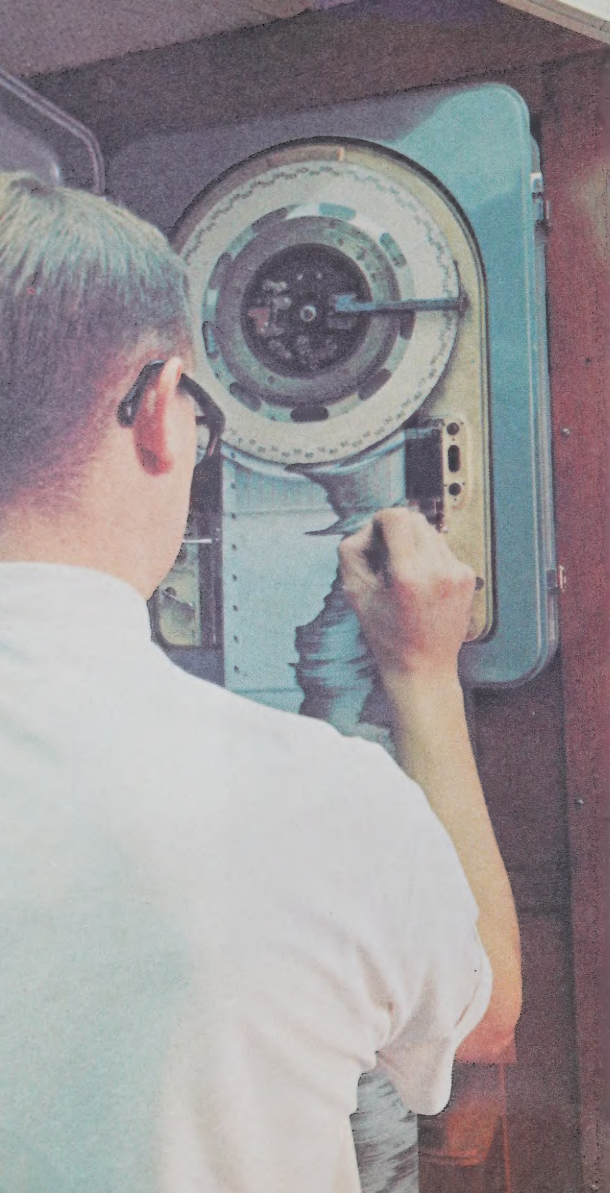
One Kelvin-Hughes MS26J, range 0-4,500 fathoms;

One Edo 185 with Alden Precision Graphic Recorder, range 0-6,000 fathoms;

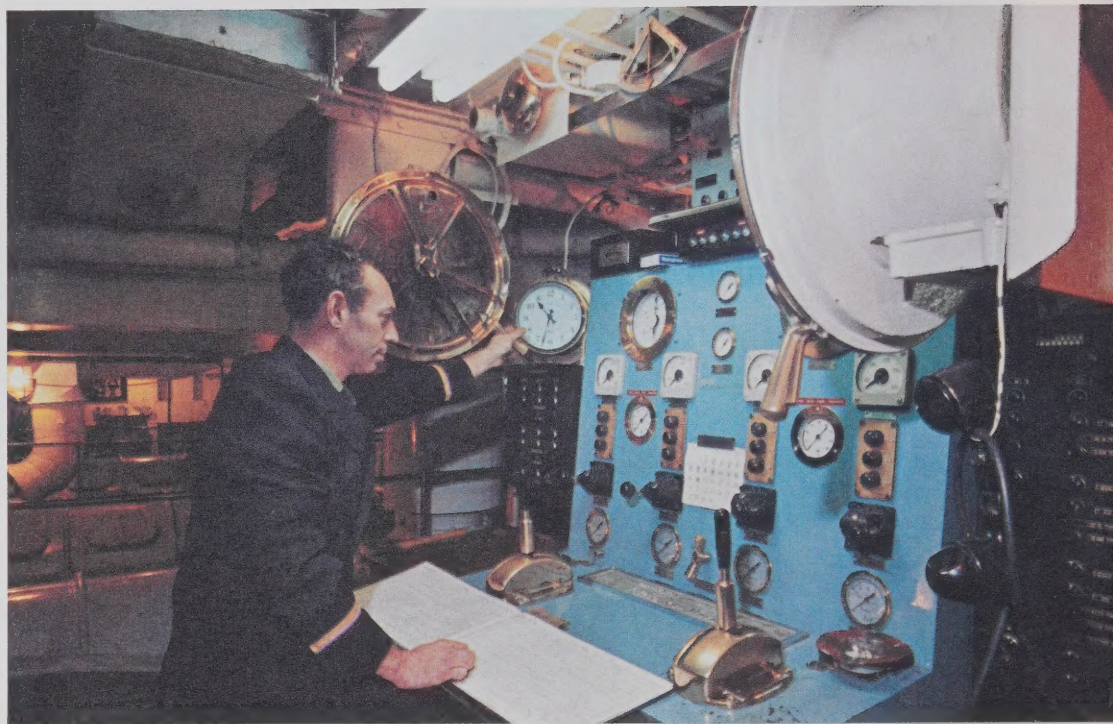
Three Kelvin-Hughes MS26B, range 0-720 feet or fathoms.



Radio communications centre.



◀ *One of the Baffin's five echo sounders.*



Engineer's control console.

Hydrography and Oceanography

Drawing office—*Baffin* has a large modern drawing office where hydrographers can draw their field sheets while at sea. Part of it serves as an oceanographic laboratory, being adjacent to the deep-sea and bathythermograph winch.

Plotting room—On the flying bridge an enclosed plotting

room enables hydrographers to carry out survey operations with greater ease than from an open bridge or from below in the drawing office.

Photographic laboratory—A process camera and dark-room facilities are installed on the lower deck for producing emergency prints of survey sheets or charts while *Baffin* is at sea.

Drawing Office.



Oceanographic laboratories—Because the vessel originally was designed only for charting purposes, the laboratory capacity is limited. There are four laboratories aboard *Baffin* for oceanographic purposes with a total area of about 600 square feet.

Oceanographic winches—*Baffin* carries one 20 HP, 240-volt DC, hydraulically driven winch on the boat deck, starboard side forward. This unit is adjacent to the laboratory in the drawing office, and has a maximum capacity of 20,000 feet. Other winches are added as the need arises. The ship is also equipped with a deep-sea anchor winch carrying 500 fathoms of 1-inch wire.

Acoustic characteristics—Although special attention has been given to noise abatement in machinery spaces and adjacent living accommodation, the vessel was not designed for special acoustic surveys.

Helicopters, launches and barges—*Baffin* can accommodate two helicopters on her landing pad and in the helicopter hangar. She also carries five 31-foot sounding launches and a 26-foot aluminum landing barge.

Accommodation—In keeping with modern standards for life at sea on extended cruises, scientists and officers all have well-furnished, single-cabin accommodation, and not more than two crew members share any one cabin. Generous washroom, dining and recreation facilities are provided for officers and crew. The ship is not air-conditioned, but

mechanical ventilation throughout allows *Baffin* to work in the tropics as well as in Arctic waters. There is a well-equipped sick-bay and a doctor is carried on most cruises. The ship's complement is usually 21 scientific staff and 81 officers and men.

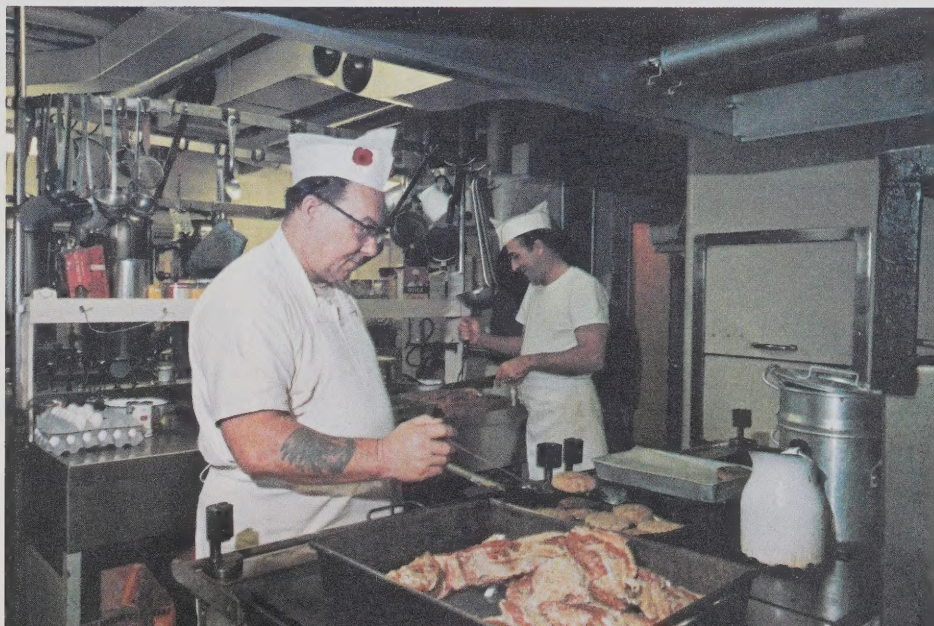


Engineers' lounge.

Hydrographers' mess.



Ship's galley.





*Captain's day room.
Hydrographer's cabin.*



History

Designed by Gilmore, German and Milne of Montreal, the *Baffin* was built by Canadian Vickers Company at Montreal at a cost of \$5 million in 1956. She is named after the great seaman and explorer, William Baffin, and carries an illustrated plaque commemorating his remarkable voyages of 1615-16, which included a memorable circumnavigation of the great bay that now bears his name.

Commissioned in January 1957, at Quebec City, *Baffin* sailed for her home port of Halifax, N.S., across the ice-infested Gulf of St. Lawrence. In February, she returned to the gulf to aid another vessel caught in heavy ice. The lessons learned on these two winter cruises held *Baffin* in good stead when she first went north.

In 1958, *Baffin* made her maiden voyage to the Arctic. During the season, the ship and a shore party surveyed Frobisher Bay and oceanographic observations were recorded enroute, particularly in the entrance to the bay.

Activities

While *Baffin* has excellent oceanographic capabilities, her primary function is that of the major hydrographic survey vessel of the Marine Sciences fleet. Oceanographic scientists and technicians are usually assigned to each cruise and

carry out research which can be undertaken while the hydrographic survey is in progress.

Designed as an Arctic survey ship, *Baffin* has proved herself in her varied career in climates ranging from the frigid Arctic to the warm waters of the Caribbean. Some of the highlights of her hydrographic activities have been:

- *A late-season survey in 1959, near Cape Dyer in Baffin Island*, where the survey was hampered by 7 feet of snow and gales between 50 and 100 miles per hour. This followed a full season's work in Hudson Strait.

- *A two-range Decca survey of Lancaster Sound in Parry Channel in 1960*. This survey demonstrated *Baffin's* versatility in the Arctic environment for which she was primarily designed. Using the ship's helicopters, hydrographers established hundreds of miles of tellurometer traverses along barren, sheer cliffs rising 1,000 feet from the water's edge. Landing barges and helicopters ferried equipment ashore to the transmitter sites, along with the complete necessities for Arctic existence for the staff. Once the stations were on the air, *Baffin* began her lonely task of running sounding lines through drift ice many miles from the nearest icebreaker support.

- *A survey of Barrow Strait west of Resolute Bay*, an Arctic area 3,000 miles from *Baffin's* home port.

As a prelude to each year's Arctic operation, *Baffin* carried

out *an electronically controlled survey off the coast of Nova Scotia*. These resulted in vastly improved charts of great value to the fishing industry.

- *An extensive Hi-Fix hydrographic survey of the Virgin Islands*, including the Sir Francis Drake Channel. This survey was a Canadian contribution to the development of the islands in the British West Indies.

- *An electronically controlled survey of the Bay of Fundy*, the body of water containing one of the world's greatest tidal fluctuations. During the survey, trials were made of a shore-to-ship telemetering link to provide continuous tidal heights from a gauge ashore to facilitate sounding reductions while the survey was in progress.

- *Cruises to the Caribbean to train hydrographers* during the winter months. This ensures that new recruits can make their maximum contribution to the efficient use of the Marine Sciences fleet during the limited period when surveys are possible in Canada's navigable waters.

- *The commencement of the modern survey of the Grand Bank of Newfoundland using Decca Lambda positioning equipment*. As a first step, *Baffin* provided essential support for the accurate positioning of Sable Island by Aerodist in 1963, in order to erect a slave transmitter on the island. Since then, *Baffin* has used her full resources in this continuing annual program of joint hydrographic and geophysical surveys with outstanding success. In 1966

she completed 22,000 nautical miles of soundings on the Tail of the Bank, positioning herself accurately by Lambda up to 500 nautical miles from the slave transmitter on Sable Island. These joint surveys provided simultaneous, detailed information on bathymetry, the nature of the bottom, sub-bottom structures, and gravity and magnetic fields.

In keeping with Canada's national program of oceanographic research, oceanographers aboard *Baffin* have carried out some interesting projects:

- *An air-sea interface study off Aruba in the Caribbean* during the period of the Virgin Islands survey. This was the first extensive field trial of a stable platform designed and built by the Bedford Institute of Oceanography. The platform was equipped with a wide range of instruments designed to measure the parameters of the complex physical interchanges that take place near the sea's surface. A full knowledge of these processes is essential to our understanding of the important effect of the oceans upon weather. The steady tradewinds gave a thorough test of the equipment which included a Canadian-developed three-component anemometer for recording turbulence in the air just above the waves.

- *A cruise to Davis Strait and the southern part of Baffin Bay* for the International Commission for the North-west Atlantic Fisheries. This cruise was in the spring of 1963, a time of year then this area was most inhospitable.

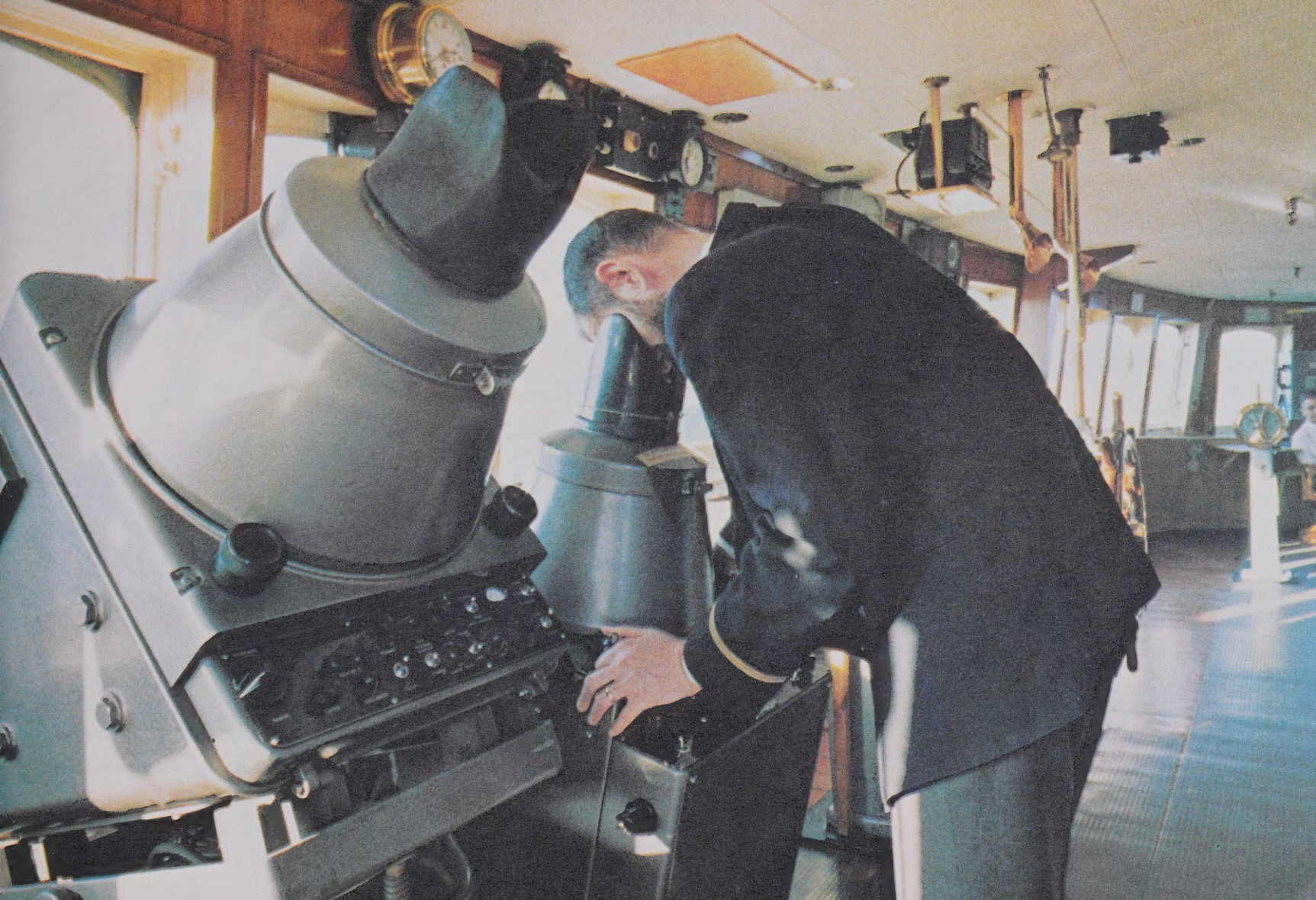
- *The discovery and subsequent geophysical survey of the Orpheus gravity anomaly*, off the south coast of Cape Breton Island. This is the first time that it has been possible to map the extension, across the Continental Shelf, of a major geological feature whose presence was not revealed by the submarine topography.

- *During the survey of the Bay of Fundy* a helicopter-airborne magnetometer was tested to speed up the acquisition of data.

◀ *Oceanographer demonstrates bathythermograph to a trainee.*

Wheelhouse (radar equipment in foreground). ▶







The Baffin in Arctic waters.



Prepared by the Editorial and Information Division

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